Melissa Regalado

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EDUCATION

Boston University College of Engineering — Boston, MA
Bachelor of Science in Computer Engineering — May 2026

SELECTED PROJECTS

Autotuning Framework for Molecular Dynamics . May 2026

- Designing an autotuning Molecular Dynamics (MD) runtime that benchmarks $O(N^2)$, cell-list, and Verlet neighbor-list force kernels across CPU and GPU back ends, automatically selecting the implementation with the lowest wall-clock time per timestep.
- Developed the shared MD simulation framework and validation pipeline**,** including Verlet timestep integration, cutoff-radius and force-field handling, and kernel-level profiling and instrumentation to study cache behavior and scaling, with numerical-stability verification using total-energy drift and cross-algorithm consistency checks.

Low-Power HBLSA SRAM Design Simulation May 2025

- Designed and simulated a 6T Static Random Access Memory (SRAM) cell, a six-transistor memory circuit used for fast on-chip data storage, implementing a Hierarchical Bit-Line with Local Sense Amplifiers (HBLSA) to reduce dynamic power.
- Assisted with transistor sizing, schematic development, and pre-recharge/sense amplifier circuit simulation to tune design parameters, validate results, and compare performance metrics.

Real-Time Image Processing System Dec 2024

- Directed system architecture design, resolved UART timing issues, and guided integration of the MATLAB-FPGA workflow for seamless image transfer and display.
- Led development of a hardware-accelerated image processing pipeline on a heterogeneous system integrating MATLAB with an FPGA, a reconfigurable platform for fast computation and real-time digital processing, enabling image darkening, brightening, and inversion via UART.

Servo-Actuated Assistive Eating Utensil May 2024

- Designed and prototyped a mechanically stabilized utensil for users with tremors or limited dexterity, achieving 100% pitch compensation and 76% roll stabilization through dual-axis servo control with motion filtering.
- Led circuit design, embedded programming, and testing trials, enabling reliable gesture differentiation and driving iterative improvements to control logic and system performance.

PROFESSIONAL EXPERIENCE

Lab Aide Dec 2025 – Present
ECE Department, Boston University — Boston, MA

- Performed verification testing on Arduino microcontrollers, op-amps, repaired speakers, and lab cabling using oscilloscopes, multimeters, waveform generators, and continuity testers to validate post-solder signal paths and component functionality.
- Assembled and QC-inspected ~200 EK307 laboratory kits and supported Circuits & Electronics instruction, including bench setup, diagnostic troubleshooting, and safe operation of soldering stations and shop equipment.

Program Coordinator Jul – Sept 2025
Touch Education Technology — Cambridge, MA

- Supported delivery of AI-integrated STEM programs by coordinating logistics, instructional execution, safety compliance, and student engagement across hybrid workshops.
- Maintained structured operational communication between students, mentors, and program leadership to ensure consistent instructional flow and issue resolution.

Senior Student Admissions Representative (Sr. SAR) May 2023 – Present
Boston University Undergraduate Visitor Center — Boston, MA

- Coordinate scheduling and participation of ~100 student reps for 200+ Virtual Student Chats per semester while leading admitted-student and virtual programming operations.
- Delivered 50+ campus tours and information sessions as a Tour Guide and Scarlet Speaker, supporting accurate academic and institutional communication.

TECHNICAL SKILLS

Programming: Python, C, C++, Java, Verilog, Assembly, MATLAB, HTML/CSS, Bash
Tools & Hardware: Cadence Virtuoso, Arduino, FPGA, Git, Unix/Linux, Soldering, Oscilloscope, Drill Press, LaTeX

CAMPUS INVOLVEMENT

Dean's Host & Tour Guide – College of Engineering — Fall 2025 – Present
Member – BU Admissions Student Diversity Board — Fall 2023 – Present